

Kiwi DNA Extraction Lab

Objective: _____

Materials:

kiwi fruit
10 ml dish soap
1/4 tsp salt
100 ml tap water
1 ml ice cold alcohol
kettle
baggies
2 large basins
coffee filter paper
knife

Procedure:

1. Peel 2-3 kiwi fruit and chop them into small chunks. (The skin is dead and doesn't have much DNA).
2. Put the chunks in a baggie and mash the kiwi. This is to break up some of the cells and provide a large surface area over which to extract the DNA.
3. Mix together the soap, salt and the tap water in a 250 ml beaker and stir slowly until the salt has dissolved. Don't stir too fast or bubbles form. This mixture is known as an extraction buffer.
4. Add the extraction buffer to the mashed up kiwi and mash. The more you mash, the more DNA you will get out at the end.
5. Make an incubator, by taking a large basin and half filling it with boiling water from a kettle. To reduce the temperature to 60° C, add about the same amount again of normal tap water. Using a thermometer to reach a more precise temperature.
6. Carefully put the baggie with the kiwi into the incubator and leave to stand for 10-12 minutes. Do not keep the mixture in the hot water bath for more than 15 minutes because the DNA will begin to break down.
7. Cool the mixture in an ice-water bath for 5 minutes.
8. Remove the baggie from the incubator and filter the kiwi mixture through a coffee filter paper into a large beaker. You should be left with a green liquid, and this contains the kiwi fruit DNA. This may be done in the refrigerator overnight.
9. Stir, then dispense the kiwi solution into test tubes about 1/3 full.
10. Take the ice cold alcohol and pour it slowly down the side of the test tube. The alcohol will form a transparent layer on top of the kiwi mixture.
11. The white DNA will precipitate out into the alcohol layer. You can hook the DNA out with a hook made from a paperclip or spool it on a glass rod.

Conclusion:

1. Explain the purpose of the soap and salt in the extraction buffer.
2. Explain why the water-bath incubator was necessary.
3. What was the purpose of filtering the kiwi mixture?
4. Why was alcohol added?
5. What test could be performed to prove that the white substance is in fact DNA?
6. Describe the DNA you extracted.

References: _____

Conclusion Answers:

The **detergent** causes the cell membrane to break down by dissolving the lipids and proteins of the cell and disrupting the bonds that hold the cell membrane together which releases the DNA into the solution. The detergent then forms complexes with these lipids and proteins, causing them to precipitate out of solution.

Heat incubation helps to break up the cells further and starts to degrade some of the cell's proteins.

The **salt** enables the DNA strands to come together. The salt allows the DNA to precipitate out of a cold alcohol solution

DNA is not soluble in alcohol. When **alcohol** is added to the mixture, the components of the mixture, except for DNA, stay in solution while the DNA precipitates out into the alcohol layer.